FIG. 1

(PRIOR ART)

FIG. 2

REPEATER ID	TRANSCEIVER ID	DATA

OR

IP ADDRESS	DATA

RESIDENCE — 300

TRANSCEIVER / REPEATER — 111a

APPLIANCE — 326 ↔ SENSOR 114a — 115

METER — 324 ↔ SENSOR 114b — 113g

SHADES — 322 ↔ SENSOR / ACTUATOR 112g — 111b

IRRIGATION — 320 ↔ SENSOR / ACTUATOR 112f — 113f

SECURITY — 318 ↔ SENSOR / ACTUATOR 112e — 113e

INT. LIGHTS — 316 ↔ SENSOR / ACTUATOR 112d — 113d

EXT. LIGHTS — 314 ↔ SENSOR / ACTUATOR 112c — 113c

HVAC — 312 ↔ SENSOR / ACTUATOR 112b — 113b
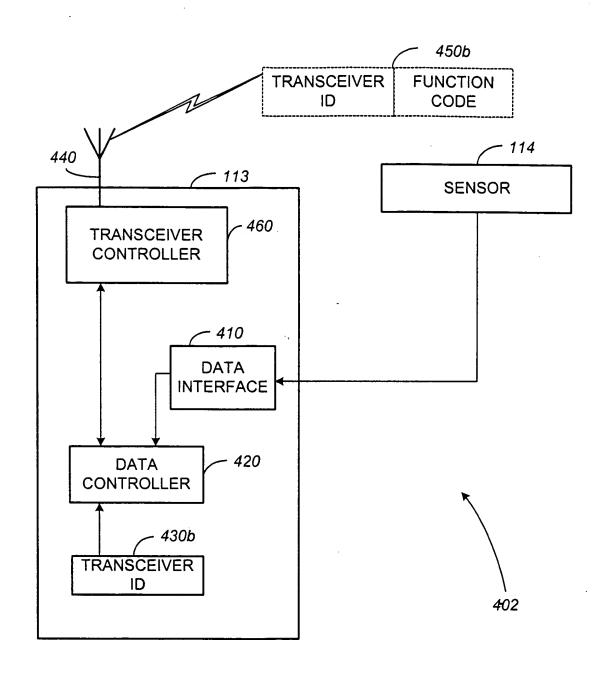
FEEDER — 310 ↔ SENSOR / ACTUATOR 112a — 113a

FIG. 3

RF TRANSMITTER w/ SENSOR

FIG. 4A

RF TRANSCEIVER w/ SENSOR
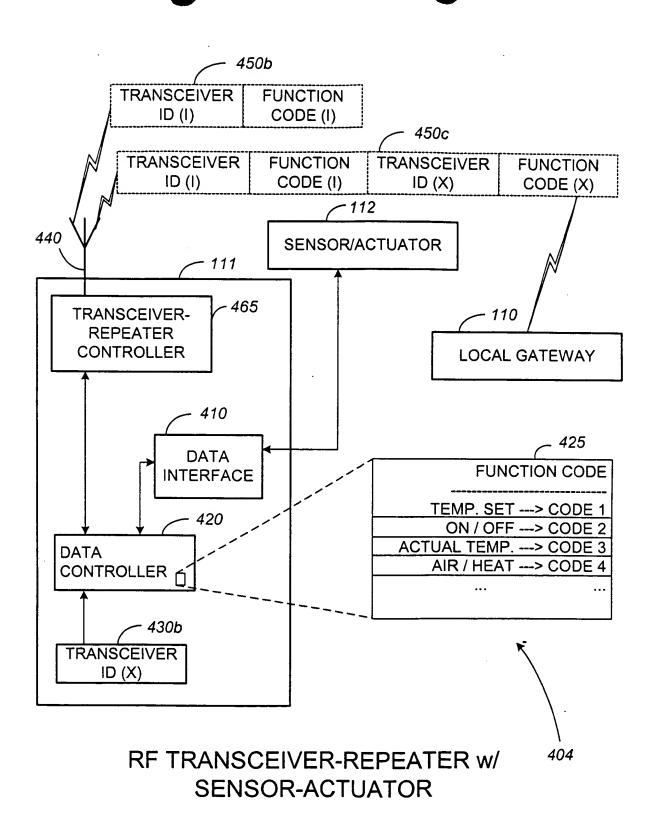
FIG. 4B

RF TRANSCEIVER w/ SENSOR-
ACTUATOR

FIG. 4C

450b

TRANSCEIVER ID (I)	FUNCTION CODE (I)

450c

TRANSCEIVER ID (I)	FUNCTION CODE (I)	TRANSCEIVER ID (X)	FUNCTION CODE (X)

440

112

SENSOR/ACTUATOR

111

TRANSCEIVER-REPEATER CONTROLLER — 465

110

LOCAL GATEWAY

410

DATA INTERFACE

420

425

FUNCTION CODE
TEMP. SET ---> CODE 1
ON / OFF ---> CODE 2
ACTUAL TEMP. ---> CODE 3
AIR / HEAT ---> CODE 4
... ...

DATA CONTROLLER

430b

TRANSCEIVER ID (X)

404

RF TRANSCEIVER-REPEATER w/ SENSOR-ACTUATOR

FIG. 4D

FIG. 5

FIG. 6 MESSAGE STRUCTURE

To Addr. (1-6)	From Addr. (6)	Pkt. No. (1)	Pkt. Max. (1)	Pkt. Lngth. (1)	Cmd. (1)	Data (0-238)	CkH (1)	CkL (1)

The order of appearance remains fixed although byte position number in each packet may vary due to one or more of the following reasons:

1. Scalability of the "TO ADDRESS" (1 to 6 Bytes).
2. The CMD Byte.
3. Scalability of the Data portion of the message (0 to 238 Bytes).

"To Address" Byte Assignment:

MSB - Byte 1 Device Type	FF-F0 (16) - Broadcast All Devices (1 Byte Address) EF-1F (224) - Device Type Base (2 to 6 Byte Address) 0F-00 (16) - Personal Transceiver Identification (6 Byte Address)
Byte 2 Mfg./Owner ID	FF-F0 (16) - Broadcast all Devices (Byte 1 Type) (2 Byte Broadcast Address) EF-00 (240) - Mfg./Owner Code Identification Number
Byte 3 Mfg./Owner Extension ID	FF-F0 (16) - Broadcast all Devices (Byte 1 & Byte 2 Type) (3 Byte Broadcast Address) EF-00 (240) - Device Type/Mfg./Owner Code ID Number
Byte 4	FF-F0 (16) - Broadcast all Devices (Byte 1 & Byte 2 Type) (4 Byte Broadcast Address) EF-00 (240) - ID Number
Byte 5	(FF-00) 256 - Identification Number
Byte 6	(FF-00) 256 - Identification Number

"From Address" Byte Assignment:

From Address	(FF-00) Full "ID" of Originating Device (up to 6 Bytes)
Packet Number	(FF-00) Packet Number of Msg. longer than 256 Bytes
Packet Max.	(FF-00) Number of Packets in Message over 256 Bytes
Packet Length	(FF-00) Length (in Bytes) of Packet/Message Transmission[*]
Command	(FF-00) Command Byte
Data	(FF-00) Data as required by specific command
ChkH	(FF-00) Packet Checksum, High Byte
ChkL	(FF-00) Packet Checksum, Low Byte

[*] Packet Length - 13 Bytes (Min.) / 256 Bytes (Max.)

Sample Messages

Central Server to Personal Transceiver - Broadcast Message - FF (Emergency)

Byte Count = 12

To Addr. (FF)	From Addr. (12345678)	Pkt. No. (00)	Pkt. Max. (00)	Pkt. Lngth. (0C)	Cmd. (FF)	CkH (02)	CkL (9E)

- -

First Transceiver to Repeater (Transceiver)
Broadcast Message - FF (Emergency)

Byte Count = 17

To Addr. (F0)	From Addr. (12345678)	Pkt. No. (00)	Pkt. Max. (00)	Pkt. Lngth. (11)	Cmd. (FF)		CkH (03)	CkL (A0)

Data (A000123456)

Note: Additional Transceiver Re-Broadcasts do not change the message. The messages are simply received and re-broadcast.

- -

Message to Device "A0" From Device "E1" Command - "08" (Respond to PING)
Response will reverse "To" and "From" Addresses

Byte Count = 17

To Addr. (A012345678)	From Addr. (E112345678)	P # (00)	P Max. (00)	P Lngth. (11)	Cmd. (08)	Data (A5)	CkH (04)	CkL (67)

FIG. 7

800

110

LOCAL GATEWAY

REMOTE SITE

140

LAPTOP
W/ WEB BROWSER

130

WAN (INTERNET /
INTRANET)

CLIENT PREMISE

810

ROUTER

820

FIREWALL

150

WORKSTATION W/
WEB BROWSER

160

SERVER W/ WEB APPLICATIONS &
CLIENT SPECIFIC APPLICATIONS

170

DATABASE
SERVER
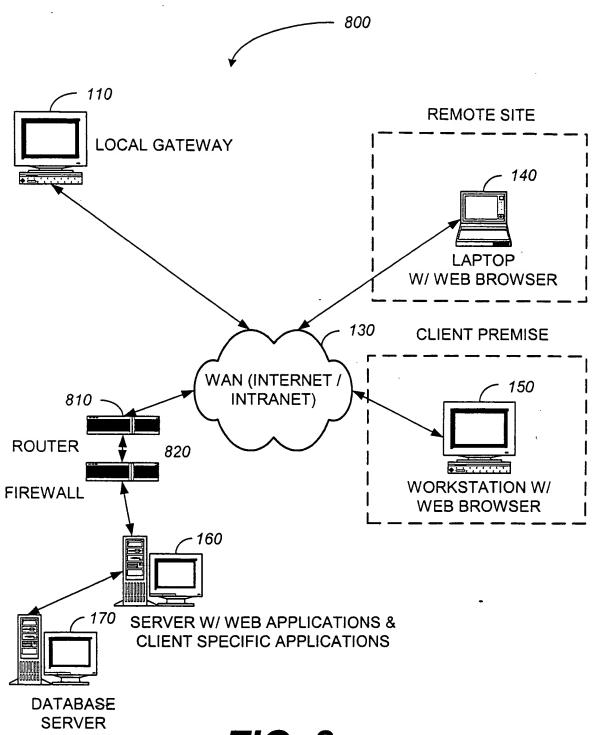
FIG. 8
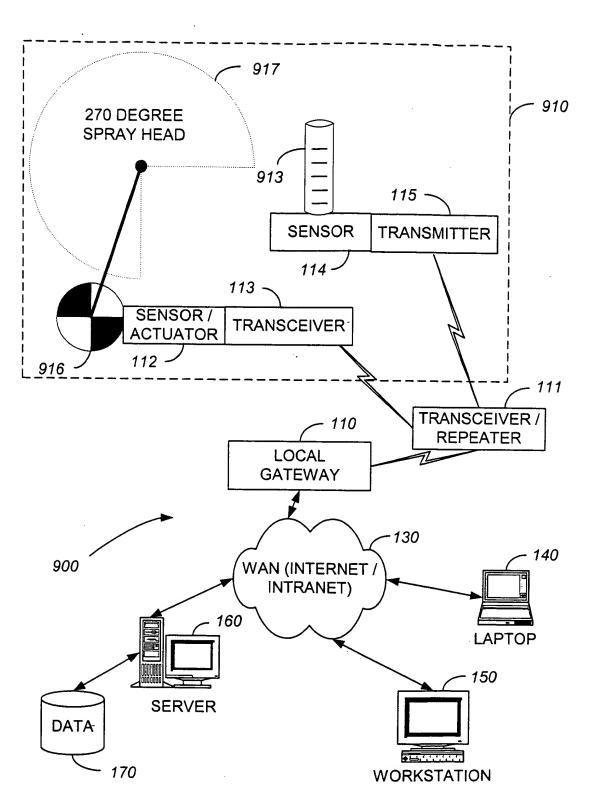
FIG. 9

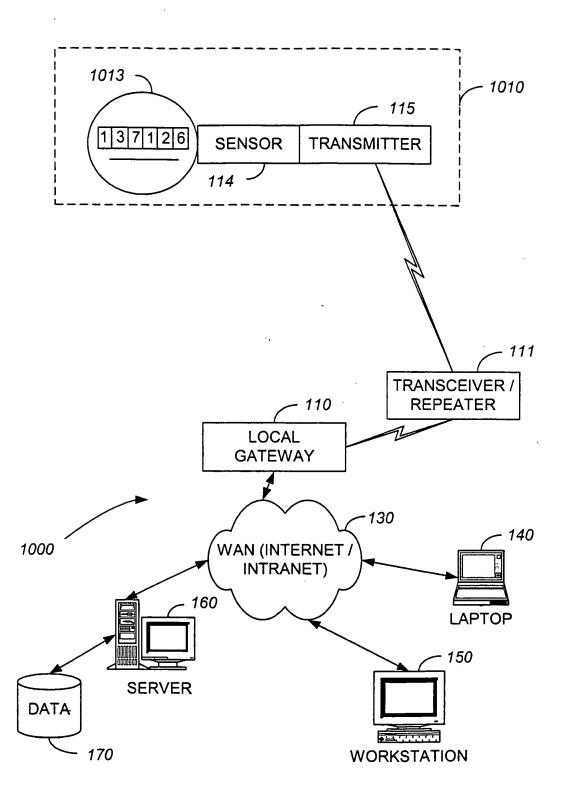**FIG. 10**

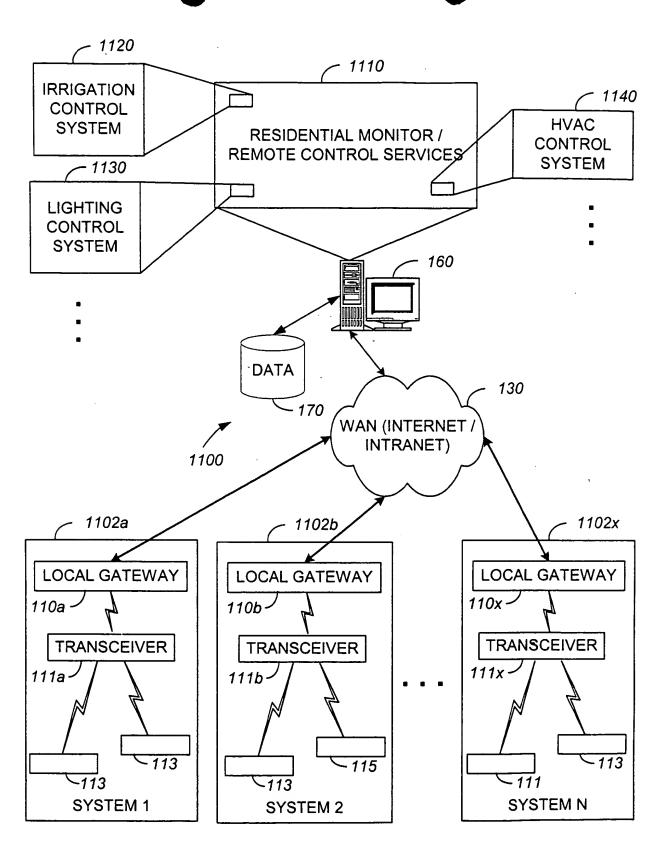**FIG. 11**

HOME MONITOR ⊟ ⬜ ✕

<u>843 GLENWOOD TRACE DR.</u>

THERMOSTAT

    MODE   AIR / AUTO ▼

    TEMP. SET   76 ▼

    TEMP. ACTUAL   75

SECURITY SYSTEM   Armed ▼

INTERIOR LIGHTING

    FOYER   ON ▼

    LIVING ROOM   OFF ▼

    KITCHEN   OFF ▼

    BEDROOM #1   ON ▼

    ⋮   ⋮

SMOKE DETECTOR

    MODE   ACTIVE

    BATTERY HEALTH   GOOD

GAS USAGE	3 5 4 8 2	MONTH TO DATE	$72.44
ELECTRICITY USAGE	0 1 1 6 2	MONTH TO DATE	$122.44
WATER USAGE	7 7 4 1 4	MONTH TO DATE	$18.75

FIG. 12A

HOME MONITOR

843 GLENWOOD TRACE DR.

THERMOSTAT

    MODE

    TEMP. SET

    TEMP. ACTUAL

SECURITY SYSTEM

AIR / AUTO
AIR / FAN
HEAT / AUTO
HEAT / FAN
OFF

INTERIOR LIGHTING

    FOYER   ON ▼

    LIVING ROOM   OFF ▼

    KITCHEN   OFF ▼

    BEDROOM #1   ON ▼

    ⋮   ⋮

    SMOKE DETECTOR

        MODE   ACTIVE

        BATTERY HEALTH   GOOD

GAS USAGE	3 5 4 8 2	MONTH TO DATE	$72.44
ELECTRICITY USAGE	0 1 1 6 2	MONTH TO DATE	$122.44
WATER USAGE	7 7 4 1 4	MONTH TO DATE	$18.75

FIG. 12B